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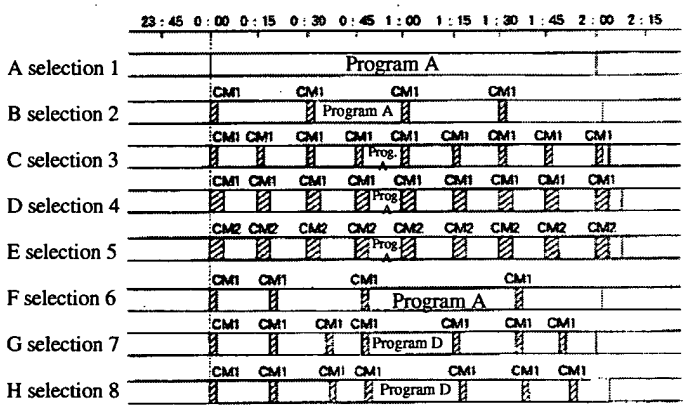
[54] Designation of the Invention: Receiving equipment for video data, transmission device and broadcasting system for same

[57] Abstract

A type of video data receiving equipment, displaying program video data that has commercial video data inserted according to desired time and desired mode, in conformance to viewer's requirements; a type of video data transmission device that transmits commercial data and program data in order to display program video signals that have commercial video signals inserted in the desired mode entered by the receiving equipment; a type of broadcasting system that displays, at the receiving party, program video signals with commercial video signals inserted according to the mode required by the viewer.



## Invention Right Claiming Document

1. A type of video data receiving equipment that includes:

   - A receiving device, that receives both the program data used to display the program video signal, as well as the commercial data used to display the commercial video signal;

   - an entry device, that enters insertion condition data, which denotes the insertion time and/or inserted amount of commercial data that is to be inserted into said program data;

   - a display device, used to display said program video signal and/or said commercial video signal; and

   - an insertion device, that inserts said commercial data into said program data according to insertion condition data denoting insertion time and/or inserted amount and coming from the entry device. Said insertion device also provides said data to said display device.

2. The video data receiving equipment as set forth in Claim 1, in which: The input data from said entry device denotes the number of times said commercial video signal is to be inserted into the program data, as well as the insertion condition data, denoting the inserted amount and which display the time amount of the commercial video signal to be inserted during the insertion time of the commercial video signal.

3. The video data receiving equipment as set forth in Claim 1, in which: The insertion condition data denotes the insertion time, said entry device inputs data representing data with equal time intervals or data with unequal time intervals.

4. The video data receiving equipment as set forth in Claim 1, in which:

   Said receiving device receives commercial data that contains a plurality of commercial video signals;

   Said entry device inputs selection data, in order to select the commercial video data required from said plurality of commercial video signals, and

   Said insertion device inserts the data, denoting the commercial data, that has been selected into said program data, and also provides the display device with these data.

5. The video data receiving equipment as set forth in Claim 1, in which:

   Said entry device selects and enters the first data and the second data; the first data represents the insertion mode that discards said program data within the timeframe when said commercial data are inserted, while the second insertion mode represents the insertion mode that delays the signal output moment of said program data when said commercial data are inserted;

   When said first data are input by said entry device, in the timeframe corresponding to the insertion of said commercial data, said insertion device discards said program data and inserts said commercial data into the program data. When said entry device enters said second data, in the timeframe corresponding to the insertion of said commercial data, said device delays the output moment of said program data, inserting by this way the commercial data into the program data.

6. The video data receiving equipment as set forth in Claim 1, in which: It contains also an output device that outputs to a communication time slot the insertion condition data coming from said entry device and denoting said insertion time and/or inserted amount.

7. A video data transmission device, that includes:

- A multiplexing device, which multiplexes, according to a certain mode, the program data used to display the program video signal and the commercial data used to display the commercial video signal. Said mode can de-multiplex this data, and can, according to instructions from the receiving party, insert insertion condition data denoting insertion time and/or inserted amount in order to insert said commercial data into said program data;

- A transmission device, that transmits to the receiving party the program data and the commercial data that have been multiplexed by said multiplexing device; and also

- A receiving device, that receives from the receiving party data denoting insertion condition data.

8. A video data transmission device as set forth in Claim 7, in which: It is also provided with a memory device used to store instructions concerning said insertion condition data received by said receiving device.

9. A video data transmission device as set forth in Claim 7, in which: Said multiplexing device multiplexes said program data and commercial data in such a way that said program data is arranged behind said commercial data.

10. A video data transmission device as set forth in Claim 7, in which: Said multiplexing device multiplexes said program data and commercial data in such a way that said commercial data is arranged into the vertical synchronization cycle of said program data.

11. A video data transmission device as set forth in Claim 7, in which: Said multiplexing device multiplexes both the first channel data containing said program data and the second channel data. In the data of the second channel, said commercial data is arranged so that at predetermined periods identical data is appearing.

12. A broadcasting system that includes:

- A multiplexing device used to multiplex program data used to display the program video signal and commercial data used to display the commercial video signal;

- a transmission device used to transmit said program data and commercial data that has been multiplexed by said multiplexing device;

- a receiving device that receives said program data and commercial data;

- an entry device that enters insertion condition data denoting insertion time and/or inserted amount of said commercial data into said program data;

- an output device that outputs to the communication line the insertion condition data denoting said insertion time and/or inserted amount that has been input by said entry device;

- a delay device used to delay said program data and/or commercial data;

- an insertion device which inserts said commercial data into said program data in accordance to insertion condition data input by said entry device and that denotes said insertion time and/or inserted amount, and also provides said data to said display device;

- a receiving device used to receive data, transmitted by said output device through said communication line, and denoting said insertion condition data;

- a memory device that stores data received by said receiving device and denoting said insertion condition data..

13. A video data transmission device that includes:

- A multiplexing device which, in accordance to insertion condition data denoting insertion time and/or inserted amount sent by the receiving party, multiplexes program data used to display program video signal as well as commercial data used to display commercial video signal;

- A transmission device used to transmit to said receiving party said program data and commercial data that has been multiplexed by said multiplexing device.

## Description of the Invention

Video Data Receiving Equipment, Video Data Transmission Equipment and Broadcasting System

The present invention concerns a type of video data receiving equipment used to receive video data, a type of video data transmitting equipment used to transmit video data and a broadcasting system used to distribute video data.

Among existing broadcasting systems, there are two kinds of universally recognized broadcasting systems.

In one of these two systems, because commercial advertising (designated hereinafter as commercial program or CMs) is inserted during the broadcasting process, viewers are not required to pay any fees for viewing said program. For ordinary TV broadcasting, programs provided by private broadcasting stations etc., are broadcasted by said kind of system.

In the other system, viewers are required to pay for each program, or pay (monthly, etc.) for program broadcasting time that replaces inserted commercials. Japan's NHK TV Broadcasting Corp., satellite TV broadcasting, cable TV, etc. all belong to this kind of system.

In these existing broadcasting systems, the specific type of broadcasting system is decided by the TV broadcasting station and not by the contents of the programs.

In reality however, all programs have their real-time value and on-time value. For example, during the broadcasting of a sports event, it is not desirable for the program to be interrupted by CMs. Some viewers want to view the program all the time during the broadcast, even if that means paying a fee. On the contrary, it is easy to understand that some viewers prefer to view those programs according to their content and do not pay much attention to inserted commercial advertisements.

Nonetheless, in existing broadcasting systems, these viewers' desires have not been thoroughly considered. For example, although it is required to pay a fee, it is still preferred to view a continuous program without any CMs, or even after the insertion of CMs, it should still be possible to view a program in its integrity at will.

The aim of the present invention consists in providing a kind of video data receiving equipment that can, according to the viewer's desire, display programs with CMs inserted in a proper form.

Another aim of the present invention is to provide a kind of video data transmission device that transmits both CMs data and program data, on this basis, said receiving device can, according to the viewer's desire, display programs with CMs inserted in a proper form.

A further aim of the present invention is to provide a type of broadcasting system. Through said system, viewer can, according to personal preference, view programs with CMs inserted in a proper form.

In order to implement the aim of the present invention, the video data receiving equipment of the present invention includes: A video data receiving device, said device includes a receiver that receives program data

used to display program video data, and commercial data used to display commercial video data; an entry device that inputs insertion condition data, denoting the insertion time and/or inserted amount of commercial data that has been inserted into the program data; a display device, used to display the program video signal and/or commercial video signal; and an insertion device, that inserts commercial data into program data according to said insertion condition data. Said insertion condition data denotes insertion time and/or inserted amount input by said entry device. Said insertion device also provides the data to the display device.

In order to implement another aim of the present invention, the video data transmission device in the present invention includes: A video data transmission device incorporating a multiplexing device, that, according to a certain mode, multiplexes the program data used to display the program video signal and the commercial data used to display the commercial video signal. Said mode can de-multiplex said data, and according to insertion condition data denoting insertion time and/or inserted amount, can insert commercial data into the program data. A transmission device, that transmits to the receiving party, the program data and the commercial data that has been multiplexed by the multiplexing device. A receiving device, that receives from the receiving party, data denoting insertion condition data.

In order to implement a further aim of the present invention, the video data transmission device in the present invention includes: A video data transmission device that incorporates a multiplexing device. According to insertion condition data denoting insertion time and/or inserted amount and coming from the receiving party, said device multiplexes the program data used to display the program video signal and the commercial data used to display the commercial video signal. A transmission device, that transmits to the receiving party, the program data and the commercial data that has been multiplexed by the multiplexing device.

In order to implement still another aim of the present invention, the broadcasting system in the present invention includes: A multiplexing device used to multiplex program data that displays the program signal and commercial data that displays the commercial signal. A transmission device used to transmit program data and commercial data that has been multiplexed by the multiplexing device. A receiving device used to receive said program data and said commercial data. An entry device used to enter the insertion condition data denoting insertion time and/or inserted amount into the program. An output device used to output into the communication line, the insertion condition data denoting insertion time and/or inserted amount into the program that has been input by said entry device. A display device used to display said program video signal and/or commercial video signal. An insertion device, which inserts the commercial data into the program data in accordance to insertion condition data input by the entry device and denoting the insertion time and/or inserted amount; said insertion device provides also data to the display device. A receiving device used to receive data denoting insertion condition data and transmitted by the output device through the communication line. A memory device that stores data denoting insertion condition data and received by said receiving device.

Through explanations of the preferred example for the present invention, and referring to accompanying figures, the aforementioned aims as well as other aims of the present invention will be further clarified.

Fig. 1 is the configuration schematic diagram of an implementation example for the broadcasting system of the present invention;

Fig. 2 is the configuration schematic diagram of an implementation example for the video data transmission device of the present invention;

Fig. 3 is the schematic diagram for the AV data configuration output by the video data transmission device shown in Fig. 2.

Fig. 4 is the configuration schematic diagram of an implementation example for the video data receiving device of the present invention;

Fig. 5A is the schematic diagram for the program data configuration when using the video data receiving device shown in Fig. 4 and viewing a program without any CMs inserted.

Fig. 5B is the schematic diagram for the program data status when using the video data receiving device shown in Fig. 4 and viewing a program that has 30 seconds of CMs inserted for every 30 minutes of program.

Fig. 5C is the schematic diagram for the program data status when using the video data receiving device shown in Fig. 4 and viewing a program that has 30 seconds of CMs inserted for every 15 minutes of program.

Fig. 5D is the schematic diagram for the program data status when using the video data receiving device shown in Fig. 4 and viewing a program that has 1 minute of CMs inserted for every 15 minutes of program.

Fig. 5E is the schematic diagram for the program data status when using the video data receiving device shown in Fig. 4 and viewing a program that has 1 minute of other CM inserted for every 15 minutes of program.

Fig. 5F is the schematic diagram for the program data status when using the video data receiving device shown in Fig. 4 and viewing a program that has CMs inserted at any time during the program.

Fig. 5G is the schematic diagram for the program data status when using the video data receiving device shown in Fig. 4 and viewing a program where the program is cutoff while CMs are inserted.

Fig. 5H is the schematic diagram for the program data status when using the video data receiving device shown in Fig. 4 and viewing a program where the program is delayed while CMs are inserted.

Fig. 6 is the schematic diagram for another status of the AV data output from the video data transmission device shown in Fig. 2.

Fig. 7 to 7C are schematic diagrams for a further status of the AV data output from the video data transmission device shown in Fig. 2.

Fig. 8 is the schematic diagram for still another status of the AV data output from the video data transmission device shown in Fig. 2.

Fig. 9 is the configuration schematic diagram of another implementation example for the video data transmission device of the present invention.

Fig. 10 is the schematic diagram for still another status of the AV data output by the video data transmission device shown in Fig. 9.

Fig. 11 is the configuration schematic diagram of another implementation example for the video data receiving device of the present invention.

Hereunder, specific implementation examples of the present invention will be described while referring to Fig. 1 to 11.

In the present implementation example, the broadcasting system as shown in Fig. 1 shall be described. Said system is composed of the audio data and/or video data (designated hereinafter as AV) transmission device, acting as the program's principal transmitting equipment, and the AV receiving device, acting as the customer terminal to receive the program at home.

Specifically speaking, it is required that the AV data transmission device 100 transmits to the customer, according to predetermined programming time the video data and the commercial data, or at least the video data (AV data or video data). Hereinafter, the audio data and the video data are designated as AV data. Each customer views the transmitted AV data through the program data receiving device 200. The customer selects the program and the type of CM insertion into the program so that he can either view said program alone or said program with inserted CMs. Meanwhile, the program viewing condition is reported back by the AV data receiving device 200 via telephone line to the AV data transmission device 100.

Hereunder, the implementation example of the video data transmission device and the video data receiving equipment used in this type of broadcasting system for the present invention are described in detail.

The implementation example of the AV data transmission device for the present invention is described first.

Fig. 2 is the configuration block diagram for a kind of AV data transmission device 100a.

The AV data transmission device 100a incorporates: a video tape recorder VTR 101, a first image encoder 102, a distributor 103, program data memory cells No. 1 to No. n, 104-1 to 104 n, CMs data memory cells No. 1 to No. n, 105-1 to 105-n, a receiving unit 106, a second image encoder 107, selector switches No. 1 to No. n, 108-1 to 108-n, multiplexing units No. 1 to No. n, 109-1 to 109-n, transmission encoders No. 1 to No. n, 110-1 to 110-n, transmission multiplexing unit 111 and transmission unit 112.

The make up of each unit shall first be explained.

VTR 101 is a playback device used to transmit input AV data to the AV data transmission device 100a. AV data transmitted by the transmission device 100a includes AV data recorded on magnetic tape, as well as real-time acquired AV data and live-broadcast data, among them, the AV data recorded and stored on the magnetic tape must first undergo the process of loading the tape into VTR 101, and the AV data played back by VTR 101 are input into the transmission device 100a, in order to prepare for the distribution process.

The first image encoder 102 encodes and compresses the video data in the AV data output by VTR 101. In the present implementation example, it is compressed by means of the MPEG-2 (Moving Picture Experts Group-2) mode. AV data compressed through the first image encoder 102 is successively input into the distributor 103. This AV data include commercial data for commercial broadcasting as well as program data, and the commercial data in their turn include video data and audio data. It must be explained here that commercial data is hereinafter designated as CM data.

The distributor 103 is a switching unit, it inputs into any one of the program memory cells No. 1 to No. n, 104-1 to 104-n, the program data contained in the AV data that has been input from the first image encoder 102. It also inputs the CM data contained in said AV data into any one of the CM data memory cells No.1 to No. n, 105-1 to 105-n. The program data and CM data played back by VTR 101 and input into the distributor 103 are input to any program data memory cell or CM data memory cell according to the communication channel

number they passed through when transmitted. Specifically speaking, program data is stored in any one of the program data memory cells No. 1 to No. n, 104-1 to 104-n, according to the communication channel number through which they were transmitted, while CM data is stored according to their input order, first into the CM data memory cell No. 1, 105-1, then into CM data memory cell No. 2, 105-2, and so on.

It must be explained that to distribute AV data, the distributor 103 is controlled by the control unit 120. The controller 120 controls the operation of the distributor 103 according to distribution information data input into and stored in the input unit 123. Distribution information data is data denoting the relationship between the encoded time data and the channel of distribution. The control unit 120 receives the encoded time data of the AV data that is played back at said moment, hence the control unit 120 determines the distribution target destination through the AV data played back at that said moment.

According to the channel number through which it was transmitted, program data, that is to say the main transmitted AV data coming from the distributor 103, is provided to program memory cells No. 1 to No. n, 104-1 to 104-n, and stored there. It should be explained that in the present implementation example, the program memory cells No. 1 to No. n, 104-1 to 104-n, are constituted by a hard disk drive device.

The storage and playback operations of program data memory cells No. 1 to No. n, 104-1 to 104-n, are controlled by the control unit 120.

According to the channel number through which it was transmitted, additional data to the AV data transmitted, such as CMs coming from the distributor 103, is provided to CM memory cells No. 1 to No. n, 105-1 to 105-n. It should be explained that in the present implementation example, the CM memory cells No. 1 to No. n, 105-1 to 105-n, are constituted by a hard disk drive device.

The storage and playback operations of CM data memory cells No. 1 to No. n, 105-1 to 105-n, are controlled by the control unit 120.

The receiving unit 106 is used to receive program data of live broadcast programs retransmitted from another location and intercepted in real time by the AV data transmission device 100a. The program data received is input to the second image encoder 107.

The second image encoder 107 encodes and compresses video data input by the receiving unit 106.

In the present implementation example, the video data is compressed by means of the MPEG-2 mode in a similar way as that of the first image encoder 102. The compressed program data of the video data pass through selector switch 108-i (where i = 1 to n) and is sent to the multiplexing unit 109-i (where i = 1 to n).

The switching operation of selector switches No. 1 to No. n (108-1 to 108-n) serves to select specific program data in order to output it to the respective channel number. Program data stored in memory cell 104-i (where i = 1 to n) is input to contact "a" of selector switch 108-i (where i = 1 to n), while program data coming from the second image encoder 107 is input to contact "b". Hence, when transmitting through a certain channel number i (where i = 1 to n) a previously prepared program, the selector switch 108-i (where i = 1 to n) at the number i emplacement will select the contact "a", while when transmitting real-time acquired "live" programs, it will select the contact "b".

According to program data selected by the selector switches No. 1 to No. n, 108-1 to 108-n, and CM data stored in the CM data memory cells No. 1 to No. n, 105-1 to 105-n, the multiplexing units No. 1 to No. n,

109-1 to 109-n, generate in channel number i (where i = 1 to n) a series of AV data to be transmitted. There are many methods for generating said transmitted AV data, however in the present implementation example, the program data stored in the program data memory cell 104-i is output continuously only after the fact that each CM data memory cell 105-i (where i = 1 to n) has stored CM data, in order to generate a series of transmitted AV data.

As stated previously, the program data stored in the program data memory cell 104-i must correspond to its channel number i, while the CM data stored in the CM data memory cell 105-i do not need to correspond to the channel number i, and can still be selected by the AV data receiving device that will be described later. However, at the precise instant when it is transmitted out by the AV data transmission device 100a, they are added in front of the program data and then sent out.

The transmission encoders No. 1 to No. n, 110-1 to 110-n, convert the transmitted AV data input by the multiplexing units No. 1 to No. n, 109-1 to 109-n, into transmission signals, and transmit the results to the transmission multiplexing unit 111. Specifically speaking, for transmission purposes, the transmission encoder 110-i (where i = 1 to n) encodes the data of the transmitted AV data, and modulates it in order to transmit it.

The transmission multiplexing unit 111 multiplexes the transmission signals output by n number of encoders 110-1 to 110-n and converts the results into signals that can be simultaneously transmitted and selected in said broadcasting system.

The transmission unit 112 transmits in reality the transmission signals that have been multiplexed in the transmission multiplexing unit 111.

Hereunder the operation process of the AV data transmission device 100a is explained.

In the present implementation example, such a situation will be described, in which, for example, four programs A to D are transmitted, and there are also, for example, two types of CMs1 and CMs2 added upon them. It should be explained that each of the programs A to D is a program of 2 hours in length, each type of CMs1 and CMs2 consist of several CMs of, for example, 15 seconds and 13 seconds connected together to form a CM of 8 minutes in length. In addition, the programs A to D are so transmitted, that they are viewed through channels 1 to 4, while the CMs1 and CMs2 are so transmitted, that they are appropriately output through each channel according to viewers' selection. Moreover, programs A to C as well as CMs1 and CMs2 are all AV data prerecorded on magnetic tape, while program D is real-time acquired and re-broadcasted AV data.

At first, VTR 101 plays back, from the magnetic tape, successively the program data containing the video and audio data of Programs A to C, that is to say the main program. Said program data is input into the AV data transmission device 100a. In other words, VTR 101 plays back successively from the magnetic tape said program data, and the first image encoder 102 compresses according to MPEG-2 mode said program data.

Program A includes program data transmitted through channel 1, hence, it is sent, through distributor 103, to the program data memory cell No. 1, 104-1. Program B includes program data transmitted through channel 2, hence, it is sent, through distributor 103, to the program data memory cell No. 2, 104-2. As to Program C, since it includes program data transmitted through channel 3, consequently it is sent, through distributor 103, to the program data memory cell No. 3, 104-3.

Thereafter, the CM data to be transmitted together with each series of program data is input in.

CM data similar to common program data is played back from the magnetic tape. It was recorded by VTR 101 and then compressed into the magnetic tape by the first image encoder 102. Thereafter, the compressed CM data is stored in successive order starting from the CM data memory cell No. 1, 105-1. Specifically speaking, the CM data from CM 1 is stored into the CM data memory cell No. 1, 105-1, the CM data from CM 2 is stored into the CM data memory cell No. 2, 105-2, and so on.

The preparation for data transmission is thus completed.

When transmitting program data, the switching position for the selector switches No. 1 to No. 3, 108-1 to 108-3, are positioned on contact "a", in order to select the program data stored in the program data memory cells No. 1 to No. 3, 104-1 to 104-3. Moreover, the switching position for selector switch No. 4, 108-4, is turned to position "b", in order to receive direct live broadcasting program coming from the receiving unit 106. According to instruction data for the mode of transmission input by the input unit, the control unit 120 controls the selector switches No. 1 to No. n,108-1 to 108-n.

Consequently, as shown in Fig. 3, if it is assumed that the broadcasting time is set to be at 0:00 hour, then at an 8-minute time interval before the broadcast time assigned to the program data, i.e. at 23:52 hours, transmission of CM data through channel 1 and channel 2 is started. Specifically speaking, the CM data stored in the CM data memory cell No. 1, 105-1, and in the CM data memory cell No. 2, 105-2, ise played back, and the played back CM data is sent to the transmission encoder No. 1, 110-1, and transmission encoder No. 2, 110-2, through the multiplexing unit No. 1, 109-1, and the multiplexing unit No. 2, 109-2, respectively. In the transmission encoder No. 1, 110-1, and the transmission encoder No. 2, 110-2, AV data for said CM is encoded. The transmitted signals in channels 1 and 2 are multiplexed by the multiplexing unit 111 and then transmitted by the transmission unit 112.

Next, 8 minutes afterward, that is to say, when the clock time is 0:00 hour, said principal programs are transmitted. The programs A to C, stored in the program data memory cells No. 1 to No. 3, 104-1 to 104-3, are then played back. The series of played back program data are input into the multiplexing units No. 1 to No. 3, 109-1 to 109-3, through the selector switches No. 1 to No. 3, 108-1 to 108-3. In addition, for the directly broadcast program D, such as a sports program, received by the receiving unit 106, the video data is compressed in the second image encoder, and then input to the multiplexing unit No. 4, 109-4, passing through selector switch No. 4, 108-4.

Thereafter, the program data input into the multiplexing units No. 1 to No. 4, 109-1 to 109-4, is encoded in the transmission encoders No. 1 to No. 4, 110-1 to 110-4, multiplexed in the transmission multiplexing unit 111 and then transmitted by the transmission unit 112.

Through the above described processing, the AV data transmission device 100a generates and transmits a program data flow as shown in Fig. 3.

It should be explained that it is also possible to use the AV data receiving device 200a, to be described later, to provide to said AV data transmission device 100a with insertion condition data denoting the insertion time and/or inserted amount of CM data into the program data. The control unit 120 of the AV data transmission device 100a receives through its input terminal 124 these insertion condition data. Then, the controller 120 controls, according to these insertion condition data, the operation of the program data memory cells No. 1 to No. n, 104-1 to 104-n, the CM data memory cells No. 1 to No. n, 105-1 to 105-n, as well as the selector switches No. 1 to No. n, 108-1 to 108-n, in order to multiplex the CM data and the program data in such

a way as to satisfy said insertion condition, and to transmit the multiplexed CM data and program data to the AV data receiving device 200a.

Hereunder, the AV data receiving device of the present invention will be described.

Fig. 4 is the configuration block diagram of the AV data receiving device 200a.

The AV data receiving device 200a includes: the reception status transmission unit 201, the receiving unit, the selection unit 203, the communication code decoder 205, the memory cell 207, the image decoder 208 and the control unit 209.

It should be explained that the AV data receiving device 200a is connected to the monitor 300 and the instruction entry unit 301. Viewers select the desired program and the mode of insertion as well as the inserted amount of CMs into said program through the instruction entry device 301, and view the program and CMs displayed on the monitor 300.

The configuration of each unit will be described first.

The reception status information transmission unit 201 is a transmission device, it transmits the programs received by the AV data receiving unit 200, and such data as: the selected amount and form of the CMs, as well as the insertion mode into the AV data on the originating side. The information about reception status is transmitted, for example, through a telephone line, to the input terminal 124 of the control unit 120 for the AV data transmission device 100a on the originating side. It should be explained that such information is used on the originating side to find out how the control for reception status is set at each customer's side, in order to serve as basic information for the payment system's charges.

Reception status information data is stored in the external memory cell 121, such as the floppy disk 122 with customer identification code data. Said identification code data eas added to said data and transmitted out from the viewer's side.

The receiving unit 202 receives signals sent by the AV data transmission unit 100a, separates signal for each channel from the multiplexed signals, and outputs the results to the selection unit 203. The receiving unit 202 is controlled by a control signal; said control signal has been generated in the control unit 209, according to the program selection signal that the viewer has entered into the instruction entry unit 301.

The selection unit 203 selects a signal from one of the channels among a plurality of channel signals input by the receiving unit 202, and sends the result into the communication code decoder 205. Said channel has been selected also according to the control signal coming from the control unit 209.

The communication code decoder 205 decodes the received signal input from the selection unit 203, and then returns it to the program data flow or the CM data flow and also outputs the results to the memory cell 207.

The memory cell 207 is a memory device used to store program data flow and CM data flow coming from the communication code decoder 205. In the present implementation example, the memory cell 207 has enough storage capacity to store 20 minutes of AV data. In addition, the memory cell 207 is made up of a storage device that can simultaneously receive and output data such as a dual port RAM. It can simultaneously receive data from the communication code decoder 205 and output data to the image decoder 208. Furthermore, for the memory cell 207, input data can pass through it and instantly be output to the image decoder 208.

In response to control signals coming from the control unit 209, the image decoder 208 reads out successively the program data and the CM data stored in the memory cell 207 and decodes the video signal. In the AV data transmission device 100a, video data is compressed according to the MPEG-2 mode and then transmitted out. Hence, the video data that has been compressed by MPEG-2 mode is decompressed and restored to the original video data form in the image decoder 208. The program data in the decoded video data is output by the AV receiving device 200a and sent to the monitor 300, so that it can be viewed on said monitor.

The control unit 209 controls all components constituting the AV data receiving device 200a, achieving thus all required operations.

Specifically speaking, and as an example, such receiving conditions for the receiving channel have been setup in the receiving unit 202, so that the channel group for the desired program can be received according to program selection signal coming from the instruction entry unit 301.

In addition, the control unit 209 controls the selection operations of received signals in the selection unit 203. The selection unit 203 selects, before the transmission of said program and according to selection data for the type of CMs coming from the instruction entry unit 301 and input by the receiver, any type of CMs among a plurality of CMs types transmitted through a plurality of channels.

Furthermore, the control unit 209 controls the memory cell 207 and adjusts all details, so that the received CMs data or program data can be reproduced in the same mode as that instructed by the receiver. That is to say, it adjusts the AV data input by the communication code decoder 205, so that it will either be forwarded directly to the image decoder 208 or will be stored in the memory cell 207. Besides, it adjusts at the same time the AV data stored in the memory cell 207, so that it will serve as AV data output to be input to the image decoder 208 or the AV data input by the communication code decoder 205 will be directly output actually.

Hereunder, the operation of the AV data receiving device 200a will be described.

In the AV data receiving device 200a described in the present implementation example, the amount of CMs viewed can be selected according to the number of CMs insertions and the length in time of each CMs. Besides, when CM programs are inserted, the desired location of their insertion can also be predetermined, that is to say, they can be inserted at any chosen times. Furthermore, when viewing direct broadcast programs, such as sport telecasts, the AV data broadcasted during the CMs insertion time can be discarded and the direct broadcast program can be viewed in real time, or in another way, the viewer can view said part of the broadcasted AV data that occurred during the insertion of the CMs, but after the end of the inserted CMs.

It should be explained that, it is assumed the AV data receiving device 200a is receiving transmission data in the way as shown in Fig. 3.

Hereunder, the operation conditions of the AV data receiving device 200a shown in Fig. 5 will be described in reference to the AV data playback status that is conform to the specific condition selected by the receiver.

Fig. 5A is the schematic diagram of the AV data status output by the AV data receiving device 200a, when the receiver is set to view the program A without any CMs inserted. Under this condition, in the AV data receiving device 200a, starting from the time of 0:00 hours, channel 1 (ch 1) is selected in the selection unit 203, the signal, received through it, is decoded in the communication code decoder 205. The decoded AV data is not

stored in the memory cell 207, but is input directly to the image decoder 208. Then, video data is decoded in the image decoder 208 and sent to the monitor 300. Consequently, as shown in the figure, program A starts at 0:00 hours, and Program A is output continuously until 2:00 hours.

Fig. 5B is the schematic diagram of the AV data status output by the AV data receiving device 200a, when the receiver is set to view program A that has a relatively few number of insertions and each insertion has CM 1 of shorter time length. Under this condition, in the AV data receiving device 200a, ch 1 that is used to transmit the AV data of CM 1 is selected by the selection unit 203 starting from 23:52 hours. At that moment, CM data is transmitted, at the same time the reception of said data starts. The AV data of the received CM 1 is successively stored in the memory cell 207.

When the time reaches 0:00 hours, the same channel ch 1 that is transmitting AV data for program A is selected by the selection unit 203, and said data starts to be received. The AV data for program A received is stored in the memory cell 207. In addition, at the time of 0:00 hour, the CM 1 data already stored in memory cell 207 start to be output from said memory cell 207. That is to say, CM 1 data is read out by the memory cell 207 and output to the monitor 300 through the image decoder 208. After 30 seconds of outputting CM 1, the memory cell 207 starts to output the AV data of program A that has been received and stored at 0:00 hours. Hence, the AV data output from the memory cell 207 has been delayed 30 seconds from their reception time.

When time reaches 0:30 hours, the memory cell interrupts again the output of program A, immediately thereafter, it outputs CM 1 data for 30 seconds. As a result, at 0:30 hours, 30 seconds of CM data is output again to viewers, during this time interval, the AV data for program A being received are stored in the memory cell 207. Afterward, when the time reaches 0:30 hours, the memory cell 207 starts to output AV data for program A that was received and stored one minute previously.

Similarly, at 1:00 hours and 1:30 hours, 30 seconds of AV data are inserted each time. As a result, the AV data output ise in the form as shown in Fig. 5B. That is to say, viewers view 30 seconds of CM for each 30 minutes, and the viewing of program A is over by 2:02 hours.

It should be explained that in order to be able to receive in said manner, the memory cell 207 must have enough capacity to store at least the output amount of CM 1, that is to say for 2 minutes.

Fig. 5C is the schematic diagram of the AV data status output by the AV data receiving device 200a, when the receiver is set to view program A that has a relatively higher number of insertions but each insertion has a CM 1 of a shorter time length. Under this condition, the operation is basically similar to that of Fig. B. At first, starting from the moment when CM transmission begins at 23:52 hours, ch 1 that is used to transmit the AV data of CM 1 is selected by the selection unit 203, and CM 1 data begin to be received, at the same time, the AV data is stored into the memory cell 207.

When the time reaches 0:00 hours, the same channel ch 1 that is transmitting AV data from program A is selected by the selection unit 203, and starts to receive said data. The AV data for program A receive is stored in the memory cell 207. In addition, the memory cell 207 starts to output CM 1 data. Thereafter, when CM 1 data has been output for 30 seconds, the AV data of program A received at 0:00 hour start to be output.

Consequently, under the condition shown in Fig. 5C, at 0:15 hours the output of program A is interrupted, immediately thereafter, CM 1 data ise output for 30 seconds. As a result, 30 second of CM data is again output to viewers at 0:15 hours. In the same way, at 0:30 hours, 0:45 hours, 1:00 hours, 1:15 hours, 1:30 hours and 1:45 hours, 30 seconds of AV data for commercials is inserted. Hence, the AV data output ise as

shown in Fig. 5C. Viewers view 30 seconds of CM every 15 minutes, that is to say view a total of 8 times, and the viewing of program A is over by 2:04 hours.

It should be explained that in order to be able to receive in said manner, the memory cell 207 must have enough capacity to store at least the output amount of CM 1, that is to say for 4 minutes.

Fig. 5D is the schematic diagram of the AV data status output by the AV data receiving device 200a, when the receiver is set to view a larger amount of insertions. Under this condition, the operation is basically similar to that of Fig. 5B and Fig. 5C. However, the output time for each inserted CMs is one minute. That is to say that under this condition, starting from the time 0:00 hours, the AV data receiving device 200a outputs CM 1 for one minute, afterward starts outputting AV data for program A received at 0:00 hours. Viewers view 1 minute of CM for each 15 minutes, i.e. a total of 8 times, and the viewing of program A is over by 2:08 hours.

It should be explained that in order to be able to receive in said manner, the memory cell 207 must have enough capacity to store at least the output amount of CM 1, that is to say for 8 minutes.

In Fig. 5E, the number of CMs and the insertion method are identical to that of Fig. 5D, but the selected type of CM differs. It means that said figure shows the schematic diagram of the AV data status output by the AV data receiving device 200a, when the viewer desires to view CM 2. Under this condition, in the AV data receiving device 200a, channel 2 (ch 2) that is used to transmit the AV data of CM 2 is selected by the selection unit 203 starting from 23:52 hours. At that moment, CM data is transmitted, at the same time the reception of said data starts. The AV data of the received CM 2 is successively stored in the memory cell 207.

When the time reaches 0:00 hours, channel ch 1 that is transmitting AV data from program A is selected by the selection unit 203, and said data starts to be received. The AV data for program A received is stored in the memory cell 207. Thereafter, still at the time of 0:00 hours, the CM 2 data already stored in memory cell 207 start to be output from the memory cell 207. That is to say, CM 2 data ise read out by the memory cell 207 and output to the monitor 300 through the image decoder 208. After 1 minute of outputting CM 2, the memory cell 207 starts to output the AV data of program A that has been received and stored at 0:00 hours. All other operating conditions are similar to those of the previously described Fig. 5D.

Fig. 5F is the schematic diagram of the AV data status output by the AV data receiving device 200a, when viewers desire to view a program with the minimum amount of CM 1 insertions, i.e. with a minimum number of insertions and a short insertion time, with the exception that CMs are inserted randomly at any given required time, the rest is similar to the situation shown in Fig. 5B.

Under this condition, channel ch 1 through which passes the AV data of the transmitted CM 1 is also selected by the selection unit 203 at the same point of time of 23:52 hours. At that moment, CM data starts to be transmitted, said data starts to be received, and the received data is also stored in the memory cell 207. When the time reaches 0:00 hours, ch 1 through which pass the AV data for the program A is selected, and the received data is stored in the memory cell 207, at the same moment, CM 1 data stored in the memory cell 207 starts to be output. Afterward, when CM 1 data has been output for 30 seconds, the AV data for program A received and stored at 0:00 hours starts to be output.

Hereafter, when the control unit 209, in order to insert CM data and according to CM insertion instruction input to the control unit 209, outputs the control signal to the memory cell 207 at any required time, the memory cell 207 interrupts the output of program A, and immediately thereafter, outputs CM 1 data for 30 seconds. During said insertion time period, the received AV data for program A is stored in the memory cell

207. Reasoning by analogy, the CMs data is inserted according to CM insertion instruction generated for every required moment of insertion.

In the present implementation example, let's assume that the CM insertion instruction is entered by the viewer through the instruction entry unit 301, that means the viewer can view CMs at any desired time whenever viewing the program.

It should be explained that this type of insertion instruction can be superimposed upon the transmitted AV data and thus be input, or it can be generated in any manners.

Fig. 5G and 5H show the selection of CM insertion methods when viewing sport programs or equivalents.

In Fig. 5G, During the insertion time of CM, the AV data received is not output, but at the point of time of reception, AV data is output together with the program. That means the program is output in consideration of its real-time characteristics.

Under this condition, ch 1 through which passes the AV data of the transmitted CM 1 is also selected by the selection unit 203 at the same point of time of 23:52 hours. At that moment, the CM data starts to be transmitted, said data starts to be received, and the received data is also stored in the memory cell 207. When the time reaches 0:00 hours, the selection unit 203 selects channel 4 (ch 4) and transmits program D through said channel, that means the program data is broadcasted directly, but the received data are not stored. On the other hand, CM 1 data already stored in the memory cell 207 start to be output. Hereafter, when the output time of CM 1 data reaches 30 seconds, the AV data for program D received through ch 4 is output actually.

Besides, let's assume the insertion instruction is based upon superimposition on the received data for the program, when it is the time of insertion for CM, upon the CM 1 signal, the memory cell 207 immediately outputs 30 seconds of already stored CM 1 data. During this insertion time, output of the program D is interrupted. During said period of interruption, the AV data for program D has been discarded actually. Thereafter, when the CM is over, starting from said moment data of the received program D ise again output.

According to this way of operation, the mode of program viewing is shown in the diagram of Fig. 5G. Although it is impossible to view the program during the CM, the AV data received can be viewed in real time.

In Fig. 5H, The AV data received during the insertion time of CM is stored, so that it can be output without damaging the continuity of the received AV data.

Starting from the point of time 23:52 hours, CM data starts to be transmitted. Channel ch 1, through which passes the AV data of the transmitted CM 1, is selected by the selection unit 203, and the received data is stored in the memory cell 207. When time reaches 0:00 hours, the selection unit 203 selects ch 4, and transmits program D, that means direct broadcast data, through said channel, and the received data during this section of time is continuously stored in the memory cell 207. Thereafter, the CM 1 data already stored in the memory cell 207 starts to be output. When the output time of CM 1 data reaches 30 seconds, the AV data for program D received 30 seconds previously is output, said data being stored beforehand in the memory cell 207.

According to this way of operation, the mode of program viewing is shown in the diagram of Fig. 5H. The real-time characteristics of the program D are thus lost, but AV data with continuity can be viewed without losing any single part of the program.

If one receives the AV data transmitted by the AV data transmission device 100a previously described in the present implementation example, and views the program according the this way of operation by using the AV data receiving device 200a of the present implementation example, then the amount, the type and the form of insertions of CMs data, i.e. AV data for the secondary transmitted object, as well as the output mode of the program, i.e. AV data for the main or principal transmitted object, can all be controlled into any modes of viewing, and the AV data can be received by the viewers in any desired modes.

Furthermore, in the AV data receiving unit 200a of the present implementation example, the mode of reception selected by the viewer can be transmitted to the transmitting party; hence, the transmitting party can accurately monitor the mode of reception of each viewer.

Hereunder is an implementation example describing other operation conditions for the AV data transmission device 100a shown in Fig. 2.

However, in this implementation example for the abovementioned AV data transmission unit 100a, the AV data of the CMs played back by VTR 101 and encoded by the image encoder 102 are all transmitted through the distributor 103, and stored in one of the n number of CM data memory cells 105-1 to 105-n. Specifically speaking, the plurality of CMs that are played back successively are stored in successive order starting from the memory cell 105-1.

In this implementation example describing the operation condition for the AV data transmission device 100a, when the AV data for CM is generated, AV data for CM is input into and stored in all the CM data memory cells 105-i (where $i = 1 - m$ and $m \leq n$) of all channels. The program data for the principal object of transmission is transmitted passing through these channels. As shown in Fig. 6, under said condition of data transmission, the CMs that may possibly be chosen are added to each channel beforehand in front of each program data, and the final data is then transmitted.

As shown in Fig.3, in the first implementation example for the course of operation of the AV data transmission device 100a as described in Fig. 3, the CMs and the main program are considered to be completely independent from each other, and the CMs can be transmitted through any one of the channels. Consequently, even if the viewer chooses to view program B, and if the selected CM data is CM 1, then the viewer must first select ch 1 until 0:00 hours, and after 0:00 hours, the viewer must then select that specific channel in which the transmitted main object program passes through at that point of time.

However, when we refer to another implementation example for the course of operation of the AV data transmission device 100 as described in Fig. 6, when the viewer selects the channel through which the program chosen by the viewer passes first, all the CM can be received by every channel, and the program can be viewed according to the previously described manner. Consequently, under these conditions, the accurate control of the selection unit 203 is not required anymore in the AV data receiving device 200a.

Hereunder, another implementation example for the course of operation of the AV data receiving device is described.

In the present implementation example, the function of the multiplexing units 109 No. 1 to No. n is different from that one in previously mentioned implementation examples. Besides, in the present implementation example, the format for transmitting data is also different from that one in previously mentioned implementation examples.

Firstly, the multiplexing units No. 1 to No. n, 109, do not transmit CM data, secondly, they neither can transmit main target program data. However, from the transmission point of view, they can multiplex the CM data contained in the program data.

In another implementation example for the course of operation of the data transmission device 100, program data is stored in the program data memory cell 104-i of each channel, while the CMs data is stored in the CM data memory 105-i of each channel. Therefore, in the multiplexing unit 109-i, a part of the CMs data read out from the CM data memory cell 105-i is inserted according to vertical synchronization mode to the video data read out by the program data memory cell 104-i, while the program AV data and CM AV data are multiplexed. Specifically speaking, as shown in Fig. 7A, during one field of program data 20 lines of CM data are inserted.

The results are shown in Fig. 7B, if it is assumed that the number of effective lines are 480 (in the NTSC system) for one frame, then 12 frames (i.e. 24 fields) are used to transmit one frame of CM video data. Moreover, one frame of CM audio data and control data becomes the equivalent in data amount to three frames of transmitted program data. Consequently and as shown in Fig. 7B, the data amount equivalent to one frame of CM is multiplexed into 15 frames of program data. The final results are shown in Fig. 7C. Thus 15 seconds of CM can be multiplexed and transmitted along with 225 seconds of program data, and four 15-second CMs, i.e. one minute of CMs can be multiplexed with 15 minutes of program data.

Data multiplexed according to this mode ise generated in the multiplexing unit 109, and then encoded in similar manner in the transmission encoder 110. Signals from each channel are multiplexed in the transmission multiplexing unit 111, and then transmitted by the transmission device 112. As a result, the programs and CM can be multiplexed and transmitted in the way shown in Fig. 8. When such a mode is selected, even in such situation as the desire to view the program is expressed at a point of time immediately before 0:00 hours, said desire of the viewer can still be satisfied.

Another implementation example of the AV data transmission device is described hereunder.

The configuration of said another implementation example for the AV data transmission device 100b is shown in Fig. 9.

In said AV data transmission device 100b shown in Fig. 9, the CM data memory cells No. 1 to No. n, 105-1 to 105-n, as well as the multiplexing units No. 1 to No. n, 109-1 to 109-n, are all omitted.

For other parts of this configuration that are similar to the AV data transmission device 100a shown in Fig. 1, the numbering of the components are similar and their description are also omitted.

In the present configuration of the AV data transmission device 100b, the CM is treated as a type of program, and a dedicated channel is provided for the CMs to be transmitted simultaneously. That is to say, when VTR 101 is playing back CM, the AV data encoded by the image encoder 102 is completely stored into the fifth program data memory cell 104-5.

Thereafter, when transmitting AV data, the CM data stored in the memory cell 104-5 is repeatedly read out, and from there transmitted through channel 5 (ch 5), in parallel with the program data for programs A to D stored in the memory cells No. 1 to No. 4, 104-1 to 104-4.

The above said transmission conditions for the AV data are shown in Fig. 10.

As shown in Fig. 10, and similarly to the previously described implementation example, starting from the time of 0:00 hours, channels ch 1 to ch 4 start to transmit programs A to D. Then, CM data ise repeatedly transmitted through ch 5.

Even though using this present configuration to transmit program data and CM data, the operation process is still similar to that of previous implementation examples for transmitting AV data by the AV data transmission device.

Therefore, when utilizing this mode of transmission, the AV data transmission device 100 no longer requires n number of CM data memory cells 105 and n number of multiplexing units 109, simplifying thus the configuration of said device.

Hereunder, an improvement to the AV data receiving device shown in Fig. 4 will be described.

The AV data receiving device 200b, in this kind of improved implementation example, receives AV data for main program data and CM data that are shown in Fig. 10 and are transmitted by the AV data transmission device 100b shown in Fig. 9, and then outputs the results in required mode to the monitor 300.

Fig. 11 is the configuration block diagram of the AV data receiving device 200b.

Apart from the configuration for the AV data receiving unit 200a shown in Fig. 4, the AV data receiving unit 200b includes also a second selection unit 204 and a second communication code decoder 206.

The first selection unit 203 selects the signal from one of the channels, through which the transmitted main target program is transmitted from among the signals of a plurality of channel signals input by the receiving unit 202, and the results are sent to the first communication code decoder 205.

In addition, the second selection unit 204 always selects that channel, through which the CMs AV data is transmitted from among the signals of a plurality of channel signals input by the receiving unit 202, and the results are sent to the second communication code encoder /sic/ 206.

The first communication code decoder 205 decodes the received signal input by the first selection unit 203, then returns it the program data flow, and outputs the results to the memory cell 207.

In addition, the second communication code decoder 206 decodes the CM signal input by the second selection unit 204, then returns it to the CM data flow, and outputs the results to the memory cell 207.

In the memory cell 207, when time reaches 0:00 hours, at first, The CM data output by the second communication signal decoder 206 is sent to the image decoder 208, and for a period of 30 seconds. During this time, the AV data of the desired program input by the first communication signal decoder 205 is stored in the memory cell 207. After outputting 30 seconds of CM, when time reaches 0:00:30 hours, the memory cell 207 starts outputting 30 seconds of AV data from the desired program that has been previously received starting from 0:00 hours and already stored in the memory cell 207. It should be explained that even at that point of time, the AV data input to the memory cell 207 by the first communication signal decoder 205 is still successively stored in the memory cell. Meanwhile, there are always 30 seconds of AV data stored in the memory cell 207.

Thereafter, when time reaches 0:30 hour, the memory cell 207 selects again the CMs AV data input by the second communication signal decoder 206, and sends it to the image decoder 208. During this time, the AV data input by the first communication signal decoder 205 is stored successively in the memory cell 207. When the 30-second output of CM ends, the memory cell 207 outputs the AV data of the desired program that has been stored in it. Meanwhile, there is always 1 minute of AV data stored in the memory cell 207.

Hereafter, whenever outputting CM, AV data coming from the second communication signal decoder 206 is similarly selected. Meanwhile, program AV data of this time period ise stored in the memory cell 207. When operating in this way, AV data can be output according to the mode described in Fig. 5B.

It should be explained that this present description is based upon receiving signals in the format shown in Fig. 10 and outputting program and CM in the mode as shown in Fig. 5B. However, this situation is similar to that of the AV data receiving device 200a shown in Fig. 4. The AV data can be output conforming to the desire of viewers and according to any one of the modes shown in Fig. 5A through 5H.

Moreover, in order to satisfy insertion conditions, the AV data transmission device 100a multiplexes CM data and program data according to insertion condition data, and when sending them to the AV data receiving device 200a or 200b it is no longer required, in the operation process of the AV data receiving device 200a or 200b, to insert CM data into the program data according to insertion condition. Hence, the AV data receiving device 200a or 200b serves only to display the received CM data and program data. It should be explained that under this operation condition, the insertion condition data must be input in advance through the instruction entry unit 301 before the reception of CM data and program data. The entered insertion condition data is provided to the reception status information transmission unit 201 through the control unit 209, and then transmitted through a communication line, such as the previously mentioned telephone line, to the control unit 120 of the AV data transmission device 100a.

In addition, through the external memory cell 121 of either AV data transmission unit 100a or 100b, the data denoting the amount, type and mode of insertion for CM data selected along with the program by the viewer will be stored in, for example, a floppy disk 121 /sic/. Therefore, available commercial type AV data transmission device 100a or 100b can be easily applied to obtain the amount, type and mode of insertion for CM data, as well as other data, selected along with the received program data and used as basic data for charging viewing fees. As for the viewing fee charge systems, such as a charge system based upon proportional program data viewing time and CM data viewing time, charge systems based upon type of program data and CM data viewed by viewers, as well as charge systems based upon both type and amount of program data and CM data viewed by viewers, etc., can all be readily realized.

It should be explained that the AV data transmission units are not limited to those described in implementation examples 1 to 4, all other variants are possible.

For example, in the present implementation examples, VTR is used to playback magnetic tapes, on the magnetic tapes program data waiting to be transmitted is arranged in successive order, which is read out and sent to the AV data transmission device. However, data originating from other recording media can also be played back, or even program data can be directly played back from video databases with very large capacity.

In addition, the video data encoding mode in the image encoder can be any other mode, and not limited to the presently described MPEG-2. Moreover, in those cases where compressed program data is sent to the program data transmission device, even if the image encoder is omitted from the real configuration, it is still applicable.

Furthermore, in the AV data transmission device 100a shown in Fig. 2, program data from a plurality of channels can be multiplexed and transmitted. However, it is also possible to utilize a completely independent system to transmit them. That is to say, the signal format can be any one at the actual transmission. Besides, the configuration of the receiving unit 202 in the AV data receiving device 200a shown in Fig. 4 can be varied at will according to the transmitted signal.

In addition, the communication link between the AV data transmission device 100 and the AV data receiving device 200 is not limited to telephone lines; radio links or satellite communication can also be used.

According to the AV data transmission equipment and AV data receiving device of the present invention, as well as the broadcasting system constituted by them, and under condition of appropriate CMs insertion, it is possible to view desired programs according to the viewer's required mode.

## Drawings Attached to the Description of the Invention

Fig. 1

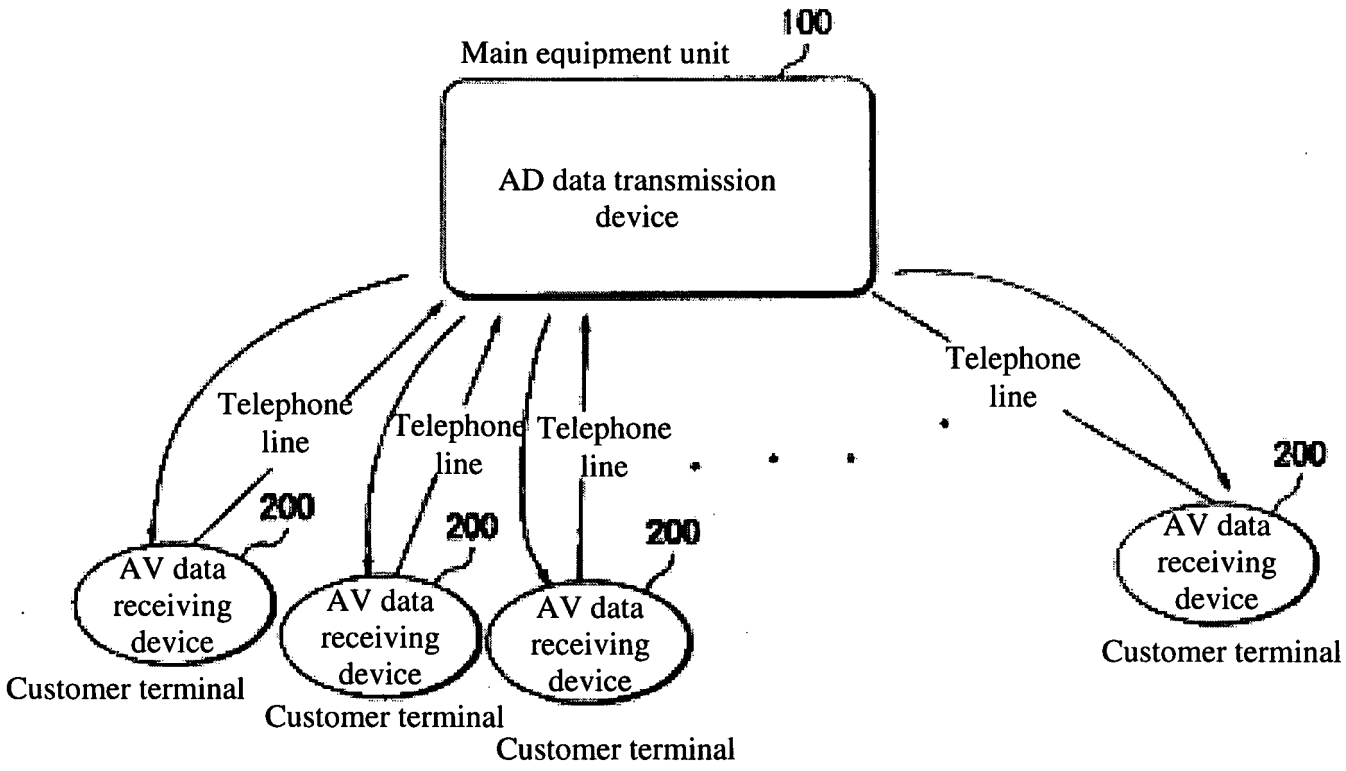


Fig. 2

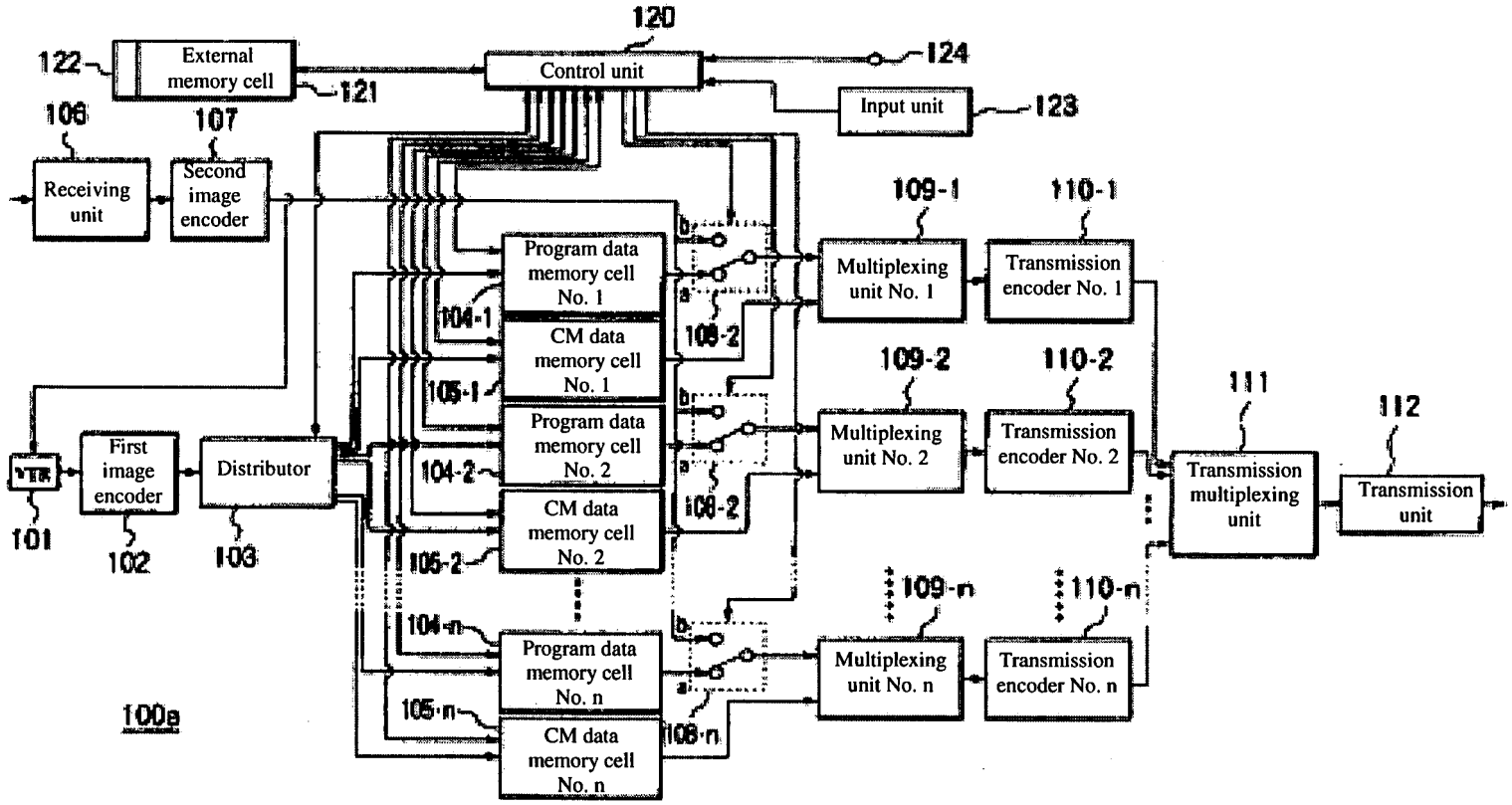

120
122
External memory cell
121
Control unit
124
Input unit
123
106
107
Receiving unit
Second image encoder
Program data memory cell No. 1
104-1
CM data memory cell No. 1
105-1
Program data memory cell No. 2
104-2
CM data memory cell No. 2
105-2
104-n
Program data memory cell No. n
105-n
CM data memory cell No. n
108-1
108-2
108-n
109-1
109-2
109-n
Multiplexing unit No. 1
Multiplexing unit No. 2
Multiplexing unit No. n
110-1
110-2
110-n
Transmission encoder No. 1
Transmission encoder No. 2
Transmission encoder No. n
111
Transmission multiplexing unit
112
Transmission unit
VTR
First image encoder
Distributor
101
102
103
100a

Fig. 3

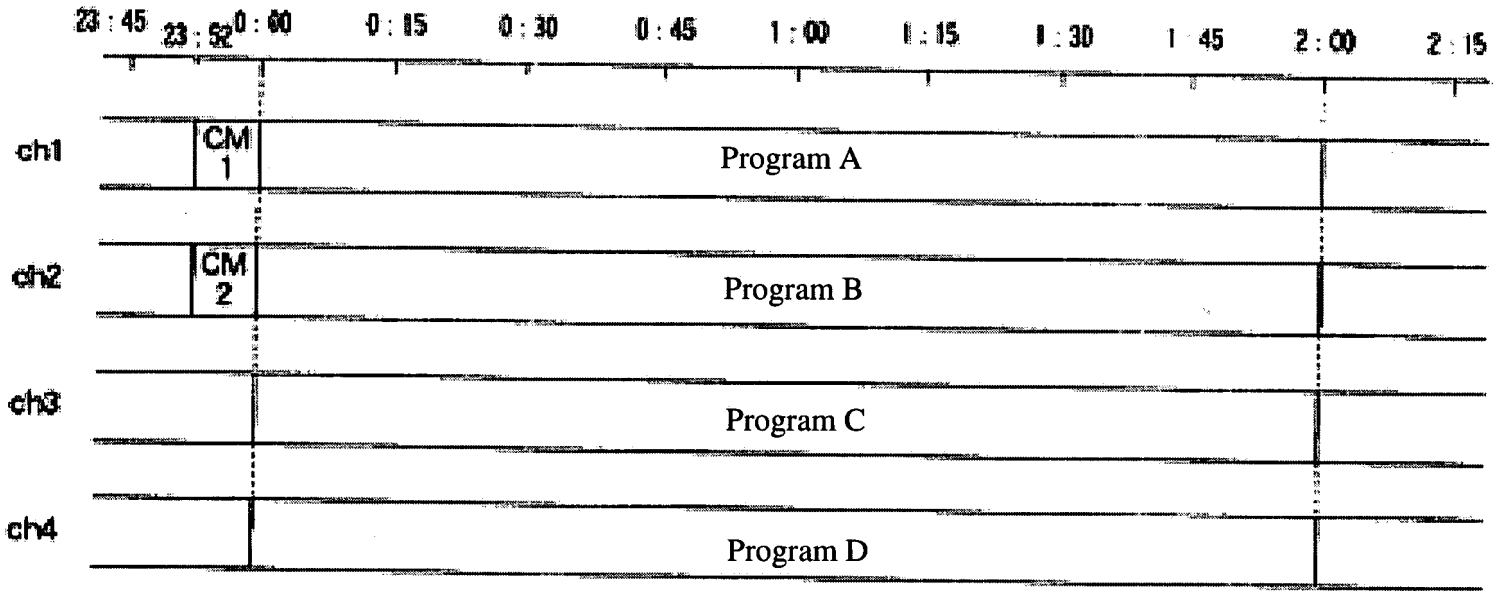

23 : 45
23 : 52
0 : 00
0 : 15
0 : 30
0 : 45
1 : 00
1 : 15
1 : 30
1 : 45
2 : 00
2 : 15
ch1
CM 1
Program A
ch2
CM 2
Program B
ch3
Program C
ch4
Program D

Fig. 4

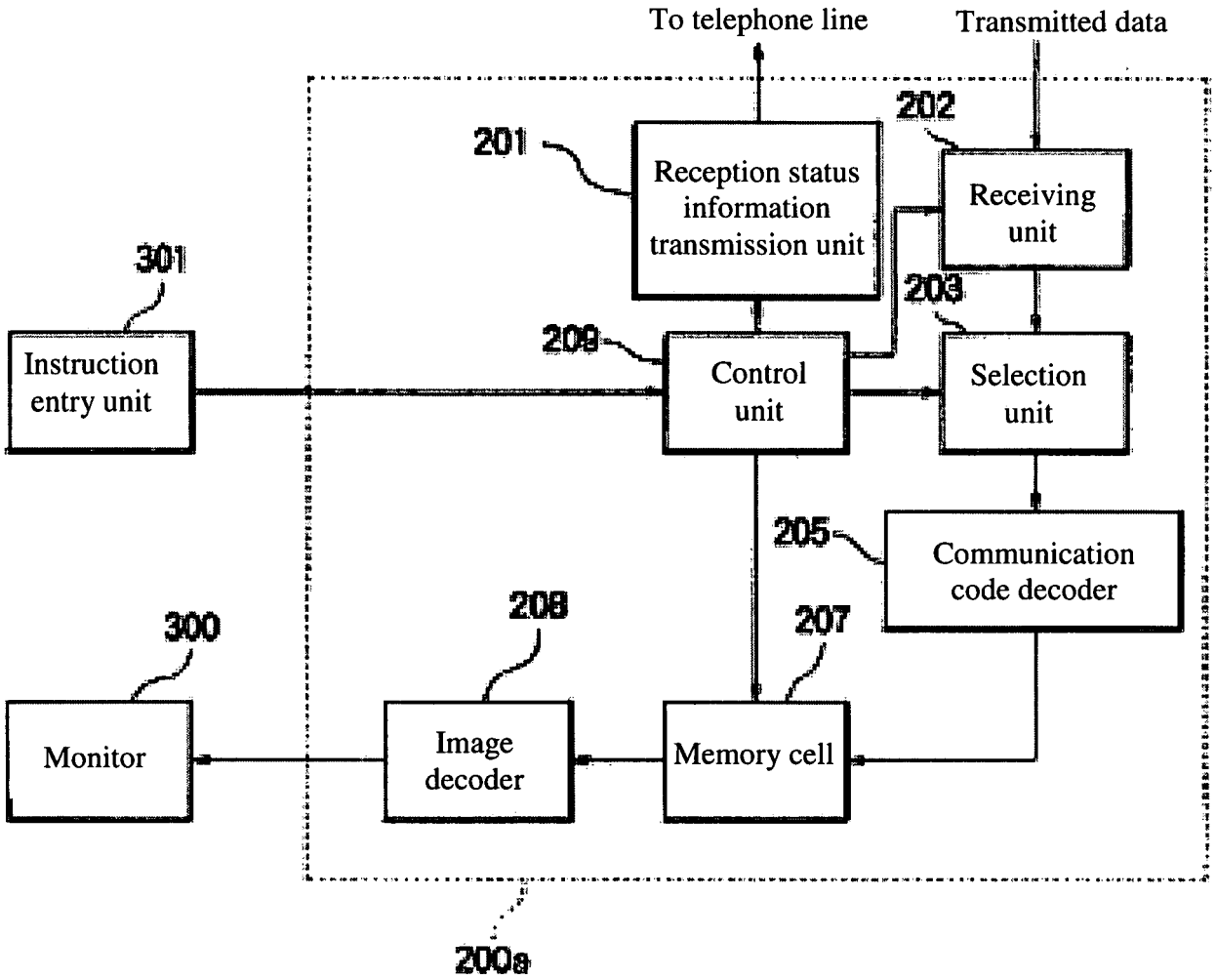

To telephone line
Transmitted data
201
Reception status information transmission unit
202
Receiving unit
301
Instruction entry unit
209
Control unit
203
Selection unit
205
Communication code decoder
300
Monitor
208
Image decoder
207
Memory cell
200a

Fig. 5

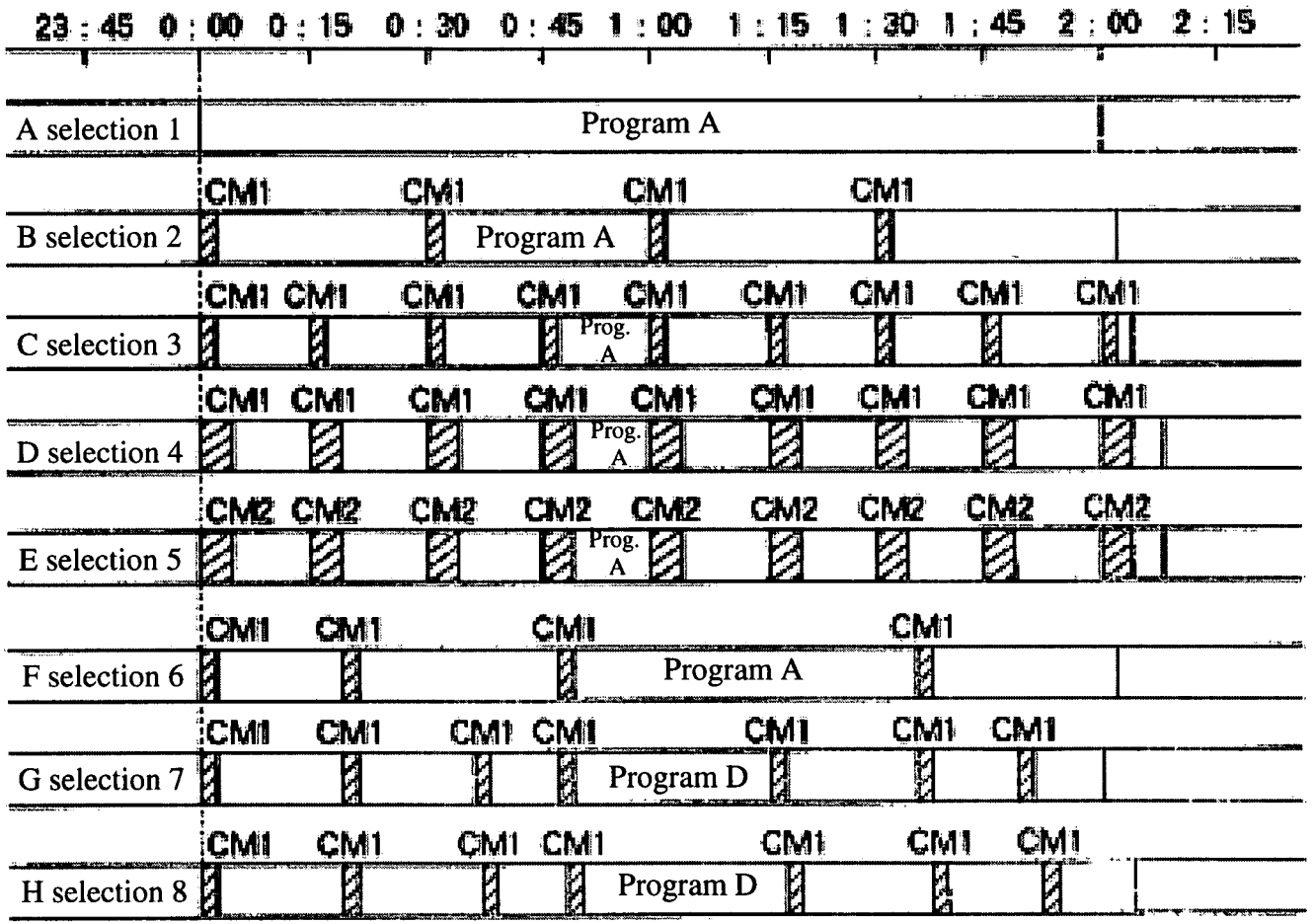

23 : 45
0 : 00
0 : 15
0 : 30
0 : 45
1 : 00
1 : 15
1 : 30
1 : 45
2 : 00
2 : 15
A selection 1
Program A
B selection 2
CM1
Program A
C selection 3
CM1
Prog. A
D selection 4
CM1
Prog. A
E selection 5
CM2
Prog. A
F selection 6
CM1
Program A
G selection 7
CM1
Program D
H selection 8
CM1
Program D

Fig. 6

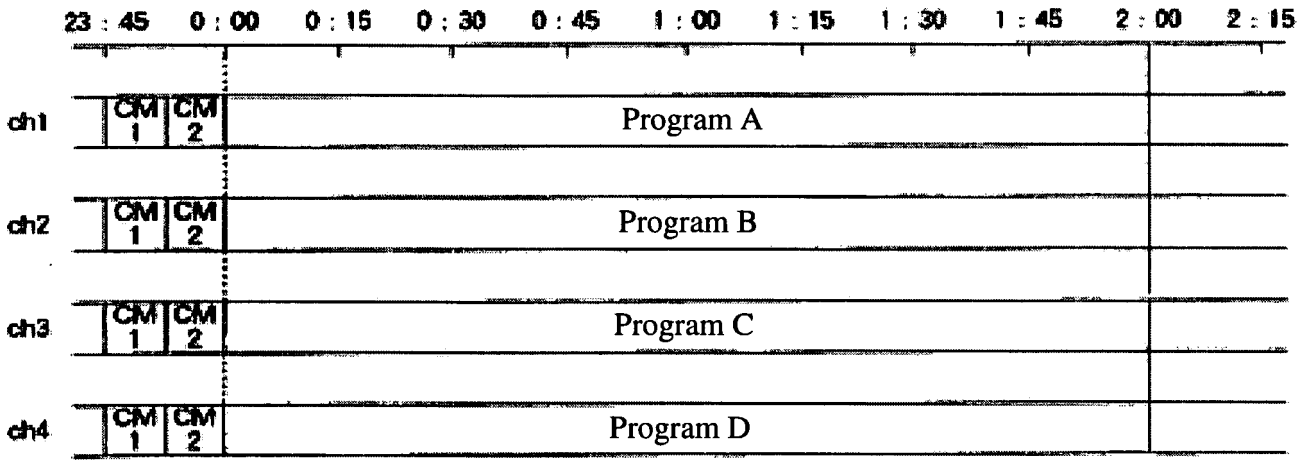

23 : 45
0 : 00
0 : 15
0 : 30
0 : 45
1 : 00
1 : 15
1 : 30
1 : 45
2 : 00
2 : 15
ch1
CM 1
CM 2
Program A
ch2
CM 1
CM 2
Program B
ch3
CM 1
CM 2
Program C
ch4
CM 1
CM 2
Program D

Fig. 7A

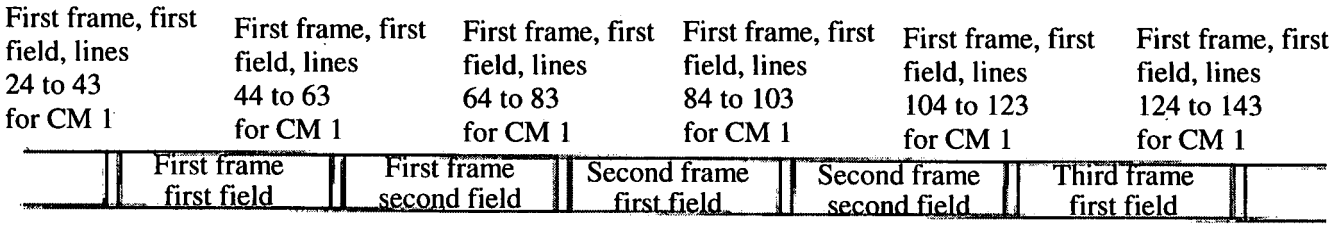



Fig. 7B

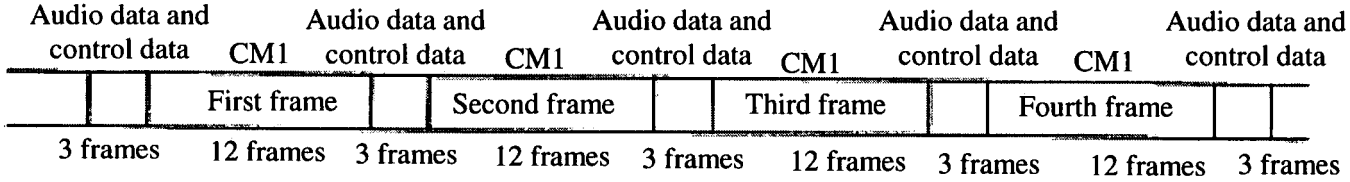



Fig. 7C

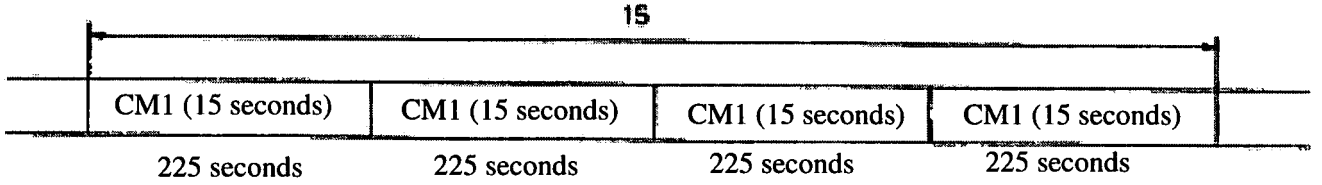


Fig. 8

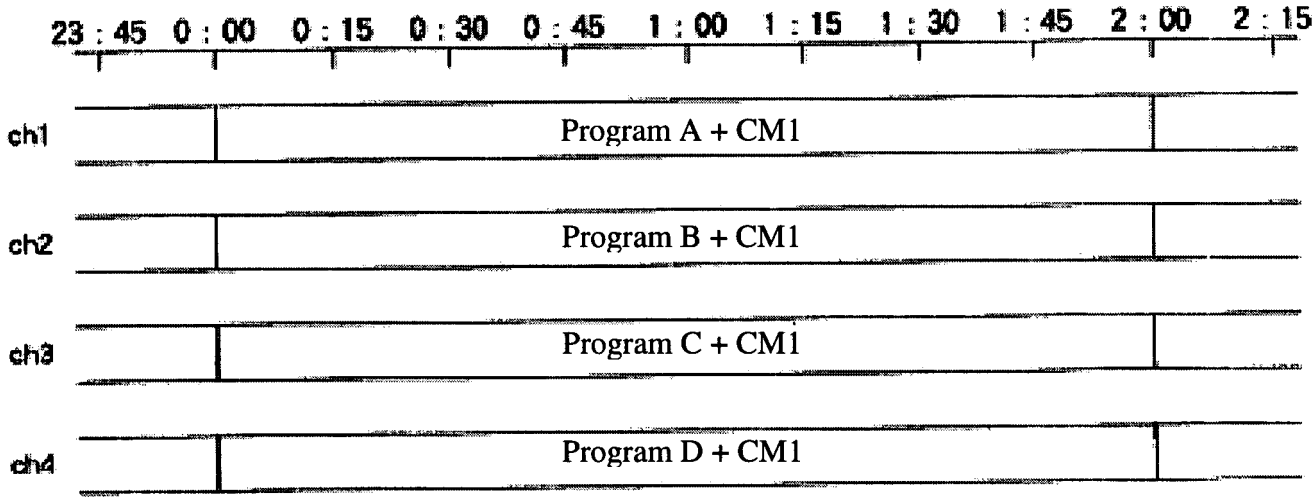

23 : 45
0 : 00
0 : 15
0 : 30
0 : 45
1 : 00
1 : 15
1 : 30
1 : 45
2 : 00
2 : 15
ch1
Program A + CM1
ch2
Program B + CM1
ch3
Program C + CM1
ch4
Program D + CM1

Fig. 9

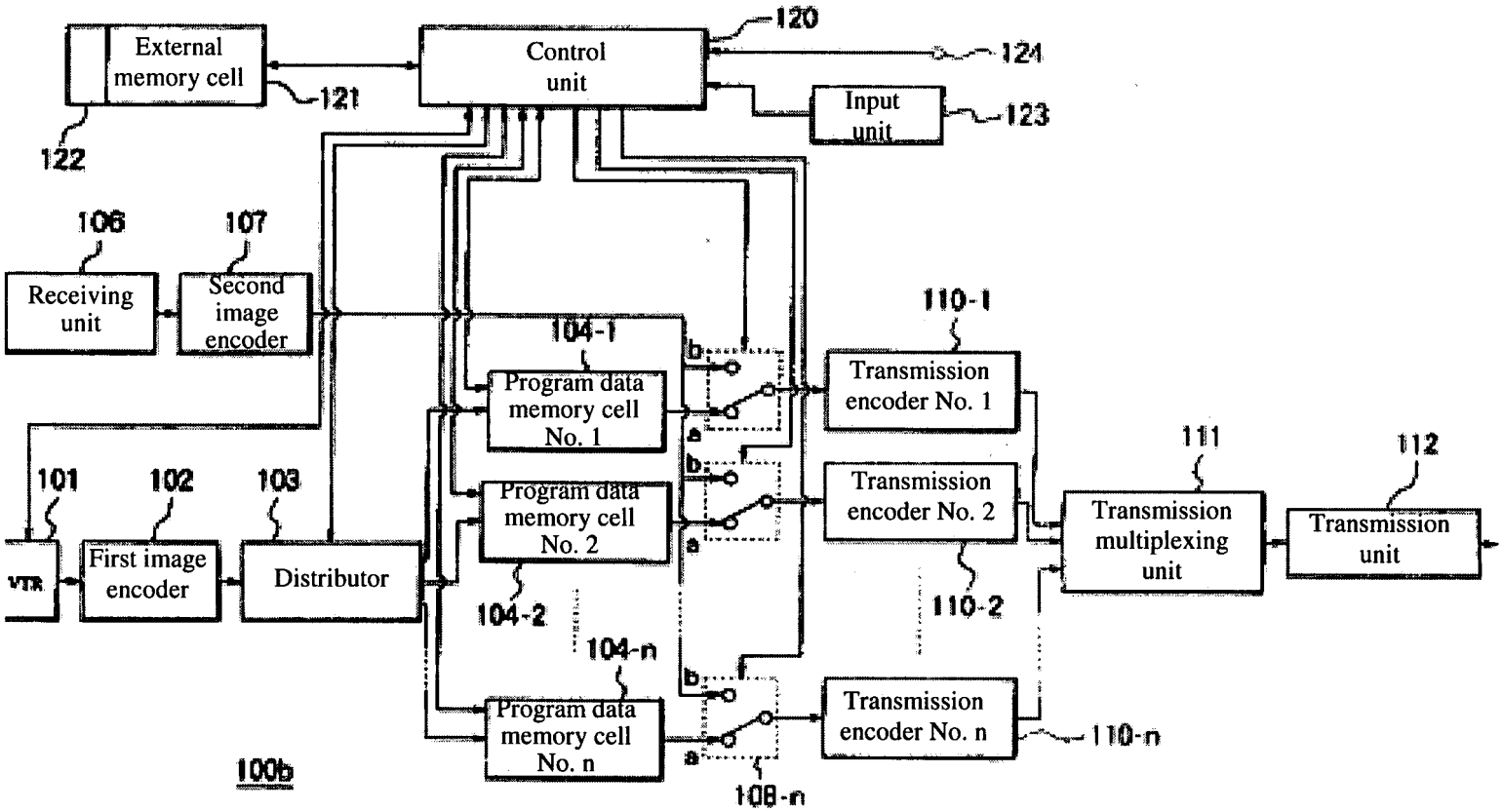

External memory cell
121
122
Control unit
120
124
Input unit
123
106
107
Receiving unit
Second image encoder
101
102
103
VTR
First image encoder
Distributor
104-1
Program data memory cell No. 1
104-2
Program data memory cell No. 2
104-n
Program data memory cell No. n
100b
108-n
110-1
Transmission encoder No. 1
Transmission encoder No. 2
110-2
Transmission encoder No. n
110-n
111
Transmission multiplexing unit
112
Transmission unit

Fig. 10

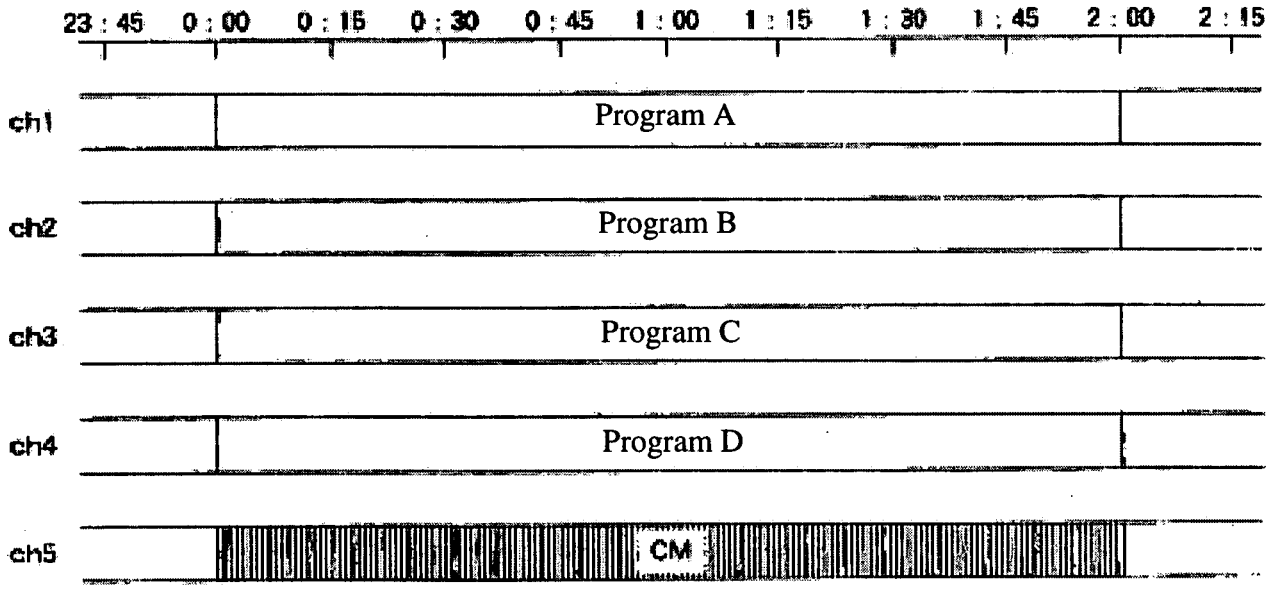
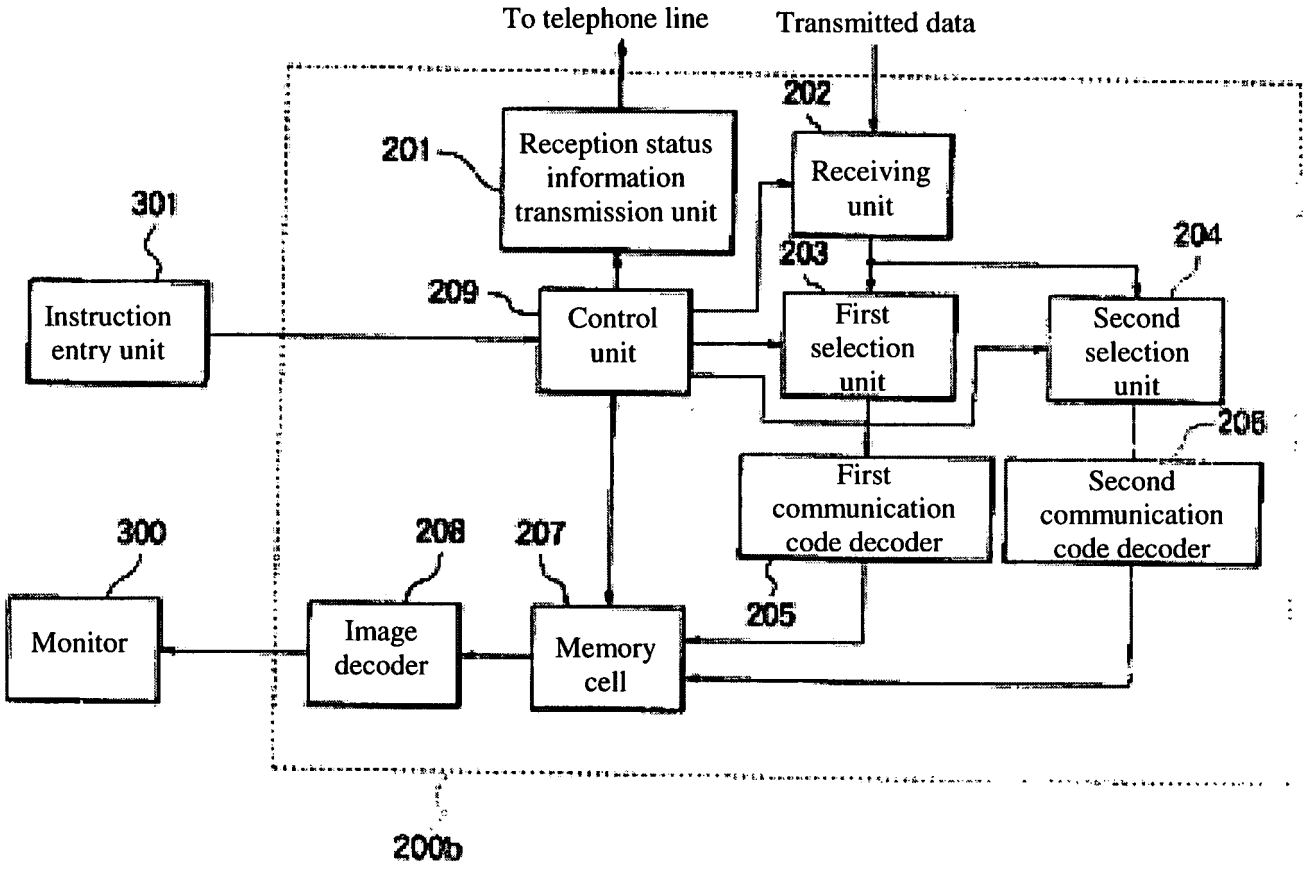

23 : 45
0 : 00
0 : 15
0 : 30
0 : 45
1 : 00
1 : 15
1 : 30
1 : 45
2 : 00
2 : 15
ch1
Program A
ch2
Program B
ch3
Program C
ch4
Program D
ch5
CM

Fig. 11


To telephone line
Transmitted data
202
201
Reception status information transmission unit
Receiving unit
301
204
203
209
Instruction entry unit
Control unit
First selection unit
Second selection unit
206
First communication code decoder
Second communication code decoder
300
208
207
205
Monitor
Image decoder
Memory cell
200b